

connection between functions within business objects. By definition, the execution of the step is synchronous with the execution of the business object.

The present invention teaches a method for use of two different routes to coordinate two route directed workflow systems to accomplish two complimentary, asynchronous functions where the second route is derived from the first route. As described in the specification, an ERP workflow and shopfloor workflow are examples where the ERP uses a workflow and first route for inventory management and production planning for a work order and the shopfloor uses a workflow and second route for controlling the flow of items and setting up machines on the shopfloor to manufacture the items for the work order. The two routes perform different but complimentary, asynchronous functions.

In the present invention, an object step defines the function of the step for the object route AND the function provided by a route segment of the second level workflow. Unlike the business object, the function of the second level workflow is NOT to accomplish the function of the object step but rather identifies the connections and functions to be executed in the second level workflow which are different from the function of the object step. Since the object route and second level routes are independent routes, the execution of the route step function is asynchronous with respect to the execution of the object step.

In the present invention, the first level route is the sequence of object steps. The second level route is formed by connecting route segments identified by the object steps. As described in detail later, the connection of the steps of second level route can be different from the connection of the steps of the object route. The level of synchronization disclosed is when the first level route starts, the second level route starts and when the second level route completes, the first level route completes. The present invention provides the identification of the relationship of steps in each route for synchronization.

Du teaches the use of business objects as subroutine calls to perform a function for a route step. The business objects are connected by the connection of the steps in the route. Du does not teach independent connection of the functions within the business

objects nor connection of the functions within the business objects that are different from the connection of steps that call the business objects. .

Du does not teach:

the use of two coordinated, asynchronous routes where the second route is derived from the first route;

the second route has different route steps and connection of route steps from the connected route steps of the first route from which the second route is derived;

an object step that defines the function of the object step AND identification of a second, complementary function that is different from the function of the object step;

the generation of the second route to perform a complementary process to the process of the primary route by connecting the complementary functions where the steps and connection of steps are different from the connection of steps of the first route;

the synchronization of the start and completion of the routes, where the primary route starts, the second route starts and when the second route completes, the primary route completes and the identification of the steps in each route to be synchronized;

Claim 22 and 23.

Du does not teach the connection of the functions within the business objects. In Du, business objects are connected by the route step connections as illustrated with forward and back arcs. Hence, Du does not teach connection of feedback connections nor teach connection of an alternative route segment. In the present invention, the alternative route segments may be selected by a conditional branch in the second route where a conditional branch may not be in the first route. Claims 22 and 23 teach that the steps in the second route may be connected differently from the connection of the steps of the first route and means to identify the different connections. Du does not teach the connection of the steps of second route and, thus, cannot teach a different connection of the second route.

Claim 24 and 25.

Du does not teach the use of two coordinated routes executing in parallel where one route signals synchronization with the other route, where the identification of the steps to be synchronization is provided by the object step. The completion signal illustrated in Du Figure 7, the signaling of the completion of one route to start another route is well

known and not claimed. The present invention provides means to identify the steps in each route to synchronize.

Claim 26-28,

Du teaches that information can be reported by a route step. This is known and not claimed.

Du does not teach the use of two coordinated routes executing in parallel. The present invention provides for a first route step in a route to report information to a first object route step in the object route. Thus, the first object route step can report information collected from the first route step. Thus, an ERP step can report the barcodes of the items at the corresponding shopfloor work center route step. The present invention provides means to identify which step in the route reports information to an object step. Du does not teach the use of a feedback path connected across objects. Hence, Du cannot teach subtracting the number of items on the feedback path from the number reported on the forward path to provide the net number of items passed to the next step. The present invention provides for identifying and connecting feedback connections and means for identifying the path from which the number of items are subtracted from the forward connection to provide the net items.

Claim 32 (In the Office Action, this is referenced as claim 33)

Du teaches the use of multiple workflow management software systems.

Du does not teach:

the use of two coordinated routes where a route for a detailed level workflow is derived by connecting route segments in the object steps of an object route for an abstract level workflow;

the use of a third computer to convert the object route for the abstract level workflow to a route for the detailed level workflow.

Summary

Du teaches the use of "business objects" as subroutines where a route can be created by connecting route steps where the route steps are business objects. The use of a sequence of subroutines to accomplish a sequence of tasks is not new to someone of ordinary skill and Du does not add insight that makes the present invention obvious.

Given Du or other prior art, it is not obvious to one of ordinary skill to:

- the use of two coordinated, asynchronous routes where the second route is derived from the first route and provide means to derive the second route from the first route where the steps and connection of steps of the second route are different from the connection of steps of the first route from which it is derived;
- an object step that defines the function of the object step AND identification of a second, complementary function different from the function of the object step and the connection of complementary functions different from connection of object steps;
- the generation of the second route from a first route to perform a complementary process to the process of the primary route by connecting the complementary functions where the connection of the steps in the second route may be different from the connection of the steps of the first route;
- the synchronization of the start and completion of the routes, where the primary route starts, the second route starts and when the second route completes, the primary route completes and means to identify the relationship between a step in the primary route and a step in the second route for synchronization;
- the connection of the steps of the second route have feedback connections or alternative connections different from the connection of steps of the first route;
- the reporting of information from a step in the second route to a step in the first route so that the information can be reported from the step first route and means to identify the reporting relationship between the route steps from each route;
- the third computer with a conversion program to derive the second route from the first route and provide the first route to the first workflow and the second route to the second workflow.

The inventor appreciates the consideration of the examiner in reviewing these points and requests that the claims be allowed.

Respectfully submitted



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